

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl. <sup>7</sup>  
G03H 1/00

(45)  
(11)  
(24)

2001 12 28  
10 - 0311908  
2001 09 28

(21)  
(22)

10 - 1998 - 0046953  
1998 11 03

(65)  
(43)

2000 - 0031090  
2000 06 05

(73)

1105604

(72)

1105604

4361207

1103-43011003

(74)

:

(54)

/

가

가

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/

.

(crosstalk)가

/

1 /  
 ,  
 2 ,  
 3 /  
 .

< >

10 : 가 20 :

21 : 1 22 : 2

30, 300 : 31, 301 : 1

32 : 2 40 :

100 : 200 :

302 : 400 :

/ , ,

/

/ (Apparatus for manufacturing wavelength division multiplexing/demultiplexing element based on the volume hologram) .

21 , &

, 가 , 가 . , .

, (dichronic filter) (fiber Bragg grating) 1998 (waveguide array) 32 ,  
 ay) 가 , 8  
 40 , .

5608826 , " Wavelength division multiplexed optical modulator and multiplexing method using same" , 545  
 0510 , " Wavelength division multiplexed optical modulator and multiplexing method using same" ,  
 5793912 , " Tunable receiver for a wavelength division multiplexing optical apparatus and method" . 5777763 , " In - line optical wavelength reference and control module" ,  
 5719974 , " Method for customizing optical device configuration after packaging and packaged optical device for use therewith" , 5553091 , " Optical component having a plurality of bragg gratings and process for the production of said components" , 5790  
 289 , " WDM optical communication method with pre - emphasis technique and an apparatus therefor" ,  
 5712936 , " Hybrid bi - directional three color wave division multiplexer and method using same" , 5680490 , " Comb splitting system and method for a multichannel optical fiber communication network" , 5550818 , " System for wavelength division multiplexing/asynchronous transfer mode switching for network communication" , 5491764  
 , " Narrowband twisted optical fiber wavelength division multiplexer" , 5696857 , " WDM/FDM fiber optic sensor architecture using WDM tap coupler" , 5566014 " Tunable add/drop optical filter providing arbitrary channel arrangements" , 97 - 011806 , " WDM , , 98 - 013061 , " , 98 - 020475 , " (WDM) 가 " .

(photoionization), (diffusion), (recombination), (space charge) , (electric field) , (drift) , (diffusion)

(drift) , 가 (diffusion) , (Pockels effect) 가

4359259 , " Holographic multiplexer/ demultiplexer" , 4387955 , " Holographic reflective grating multiplexer/demultiplexer" , 5500910 , " Passively aligned holographic WDM"

(fiber Bragg grating) , (crosstalk)가 , 가 .

, 가 가

/

/

( )

(fixing)

( )

( )

1

1

/

1

가 가 (tunab

le laser; 10) ;

(reference beam) (object beam) (beam splitter; 20) ;

(200) ;

(20)

(200) (30) ;

(200)

(20)

(200) (20

0)

(40) ;

(20)

1 (21); (200) (20)

$$\frac{1}{2} \frac{(20)}{(22)}; \quad (30) \quad (20)$$

$$\frac{(10)}{(40)} \quad \frac{(20)}{(200)}$$

(wavelength division multiplexing/demultiplexing element)

(100)

$$\frac{(30)}{90^\circ} \quad \frac{(20)}{90^\circ} \quad \frac{(31)}{1} \quad (31); \quad (20)$$

$$\frac{(31)}{2} \quad (32) \quad \frac{(200)}{90^\circ} \quad (200)$$

(200)  $\text{LiNbO}_3$ , BSO,  $\text{BaTiO}_3$

$$2 \quad \frac{2}{2}$$

$$\left( \frac{2}{2} \right) \quad \left( \frac{2}{2} \right)$$

(Bragg's m

atching condition)

$$\frac{(200)}{\theta} \quad \frac{(200)}{\theta} \quad \frac{L}{k} \quad \frac{1}{k}$$

$$= k(-\sin \theta + \cos \theta) = k(-\sin \theta + \cos \theta) =$$

$$n \quad \lambda$$

$$\frac{K}{k^2} \quad \frac{k}{k}$$

$$|k| = |k' + K + ?k| = k$$

$$k' \quad k' \quad ?k \quad \eta < 1$$

3 .

$$\eta \quad \text{sinc} \left( \frac{3}{2} kL \right)$$

4

$$| \frac{3}{2} k | \leq$$

(wavelength multiplexing)

가

가

" "

$$v \left( \frac{1}{2} \right)$$

$$v - \frac{1}{2} v$$

$$\frac{5}{1} \quad \frac{1}{2} v$$

가

$$\frac{5}{2} k \left( 1 + \cos \theta \right)$$

$$\frac{5}{6} \quad \frac{1}{2} k$$

$$\frac{5}{6} \quad \frac{1}{2} k$$

가

5

$$\frac{6}{2} v \quad \frac{1}{2} v$$

$$\frac{800\text{nm}}{8} \quad \frac{820\text{nm}}{8} \quad \frac{1}{2} v = 2.95\text{GHz}$$

$$\frac{1}{2} v = 2.95\text{GHz} \quad \frac{1}{2} v = 2.95\text{GHz}$$

$$9,146 \text{ GHz}$$

가

가

(200)

/

1

(100)

가

(10)가

가

(20)

(reference

beam)

(object beam)

(20)

(21)

(21)

(20)

(200)

(100)

(20)

(21)

(200)

(20) 2 (22) 1 (31) 2 (32)  
 (22) (20) (30) (20) (32)  
 100) (31) 가 90. 90. , 2 (32) 1 (31)  
 90. (200)

(200)

$\text{LiNbO}_3$ , BSO,  $\text{BaTiO}_3$

(40)

(200)

(200)

(40)

(rack)

(pinion)

(gear mechanism)

가  
 (200)

(step motor)

(rack)

(100)

(40)

(200)

(200)

00)

(2

(100)

(10)

가

가

가

(40)

(200)

(fixing)

가

(200)

가

가

, (200) 가

/

(200) 가

, (200)

.

(200) 가 (40)

(200) 가 (200) 가

가

.

2

3

/

3 가 (10) ;

(reference beam) (object beam) (20) ;

(200) ;

(200) 가 , (20)

(200)

(300) ;

(200) (200)

, (400) ;

(20) (200) (20)

1 (21);

(20) (300) (20)

2 (22);

가 (10) 가 가

, 가 (200)

(400)

(100)

.

/

, (300) 가 90. (20) 90. 1 (301);

1 (31) 90. (400) (200) (302) (200)

, (200)  $\text{LiNbO}_3$ , BSO,  $\text{BaTiO}_3$

, 3

가 가 ,

, (200) 가

3 가 , (100) 가 (10)가 가 (20)

, (reference beam) (object beam)

(20) 가 (200)

, (20) 2 (22) 2 (20) 1 (301) (302) (100) (301)

가 (20) 90. (302) 1 (301) 90. (400) (200)

(200) (200) 가 (200) (300) (302)

, 가 (200) (200) (400) (100) (200) (200)

, (400) 가 (40) 가 , (rack) (pinion) (gea  
r mechanism) (302) (rack) (step motor) (100)  
.

(400) (302)

(100) 가 (10) 가 가  
가 (400) (20  
0) / .

(300) 가  
가

(200) 가 가  
(200)

0,5 가 / , 0.8 nm  
/ / .

, 13% 가가 , 2010 130  
가 ,

2001 , 8 2 40 .

(terminology)

가  
가  
가

, 가

가

,

/

/

/

(crosstalk)가

(57)

1.

가

가

(tunab

le laser) ;

(reference beam)

(object beam)

(beam splitter) ;

;

;

;

가

가

가

가

/

;

1

;

2

/

.

2.

1

90 °

,

,

가

90 °

1

;

1

90 °

2

/

.

3.

1

,

, LiNbO<sub>3</sub>, BSO, BaTiO<sub>3</sub>,

(polymer)

/

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4.

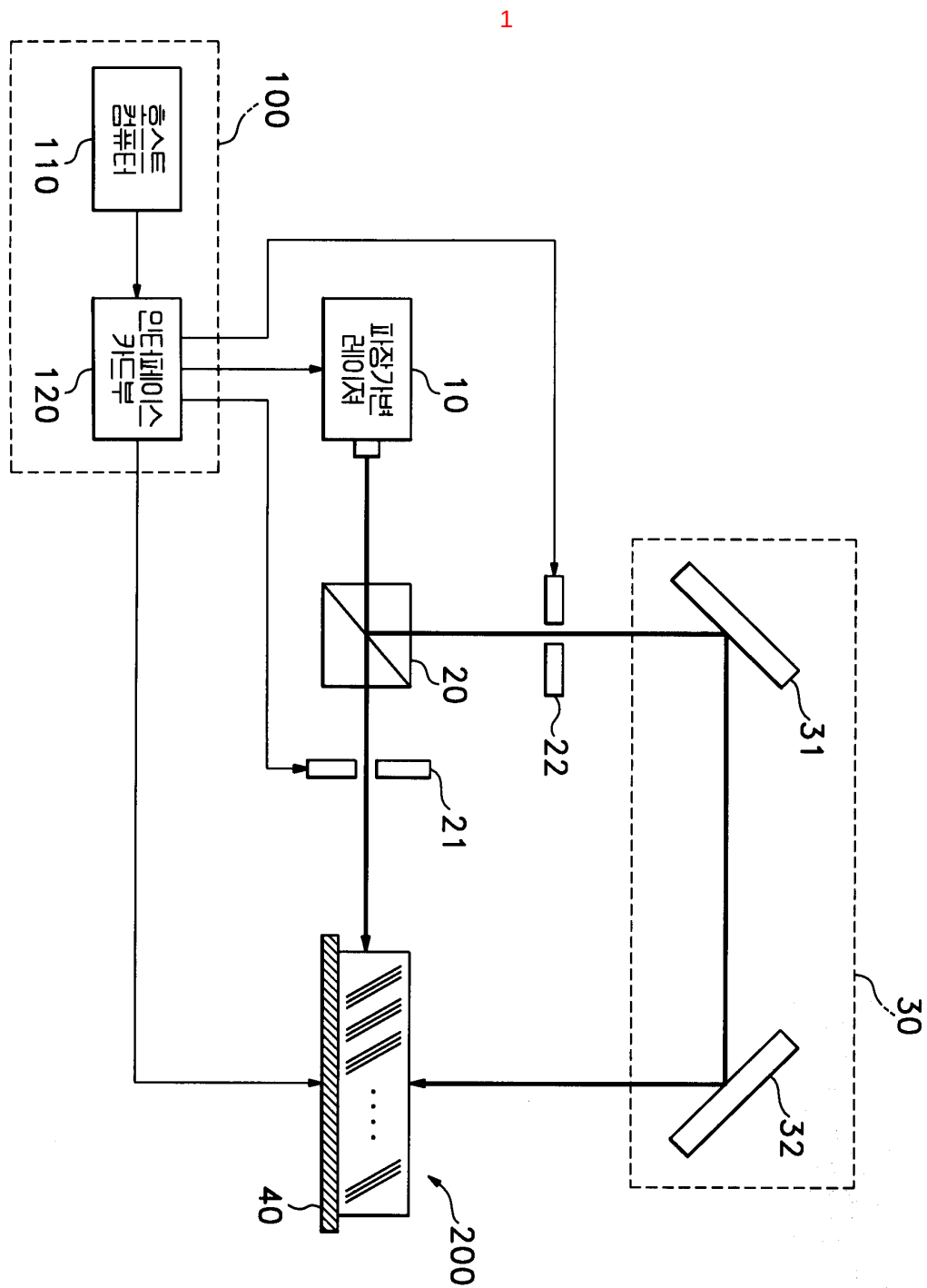
가 ; (reference beam) (object beam) (beam splitter) ; ; 가 , ; 가 가 가 가 / ; 1 ; 2 / .

5.

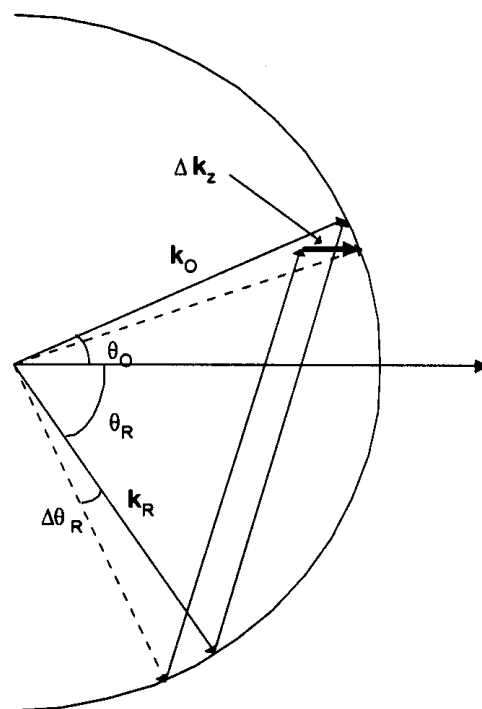
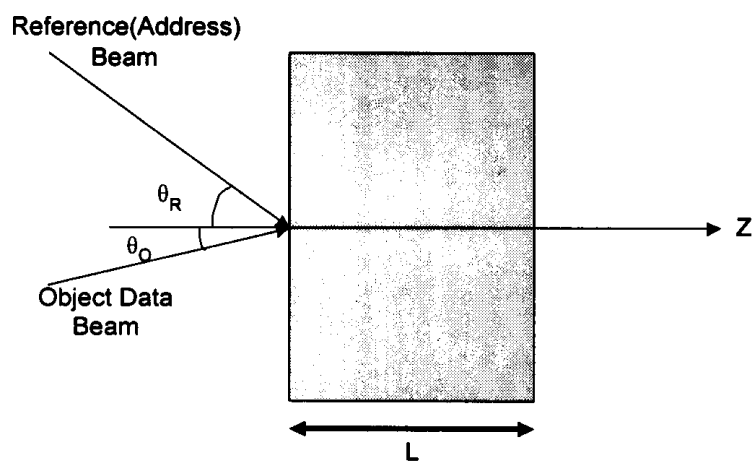
4 , , 가 90 ° 90 ° 1 ; 1 / .

6.

1 , , LiNbO<sub>3</sub>, BSO, BaTiO<sub>3</sub>, (polymer) / .



2



3

